

## SECTION 02221

### TRENCHING, BACKFILLING & COMPACTING

#### PART 1 GENERAL

##### 1.01 DESCRIPTION

- A. The work of this section includes, but is not limited to:
  - 1. Cutting paved surfaces
  - 2. Blasting
  - 3. Trench excavation, backfill and compaction
  - 4. Support of excavation
  - 5. Pipe bedding requirements
  - 6. Control of excavated material
  - 7. Rough grading
  
- B. Related work specified elsewhere
  - 1. Clearing and Grubbing: Section 02100
  - 2. Rock Removal: Section 02225
  - 3. Grading & Seeding: Section 02485
  - 4. Paving and Resurfacing: Section 02575
  
- C. Applicable Standard Details
  - 1. Pipe trenching, bedding and concrete encasement details as shown on the Contract Drawings.

##### 1.02 QUALITY ASSURANCE

- A. Testing Agency
  - 1. Contractor is responsible for compaction testing, which shall be performed by a Soils Testing Laboratory engaged and paid for by the Contractor and approved by the Engineer.
  
- B. Reference Standards
  - 1. Pennsylvania Department of Transportation (PennDOT)
    - a. Regulations Governing Occupancy of Highways by Utilities (67 PA Code, Chapter 459)
    - b. Publication 408 Specifications, Latest Edition
    - c. Pennsylvania Test Method, PTM 106
    - d. Pennsylvania Test Method, PTM 402
    - e. Publication 203, Work Zone Traffic Control

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2. American Society for Testing and Materials (ASTM)
  - a. ASTM C33 Specs. for Concrete Aggregates
  - b. ASTM D1557 Test for Moisture-Density Relations
  - c. ASTM D1556 Test for Density of Soil in Place by the Sand-cone Method.

#### C. Compaction Testing

1. Conduct one test for each 400 linear feet of pipeline. Conduct compaction tests at locations as directed by the Engineer during backfilling operations.
2. Determine compaction in state highways and shoulders by the testing procedure contained in Pennsylvania Test Method, PTM 106, Method B or PTM 402.
3. Determine compaction in areas other than State highways and shoulders by the testing procedure contained in ASTM 1557 or ASTM D2922.

### 1.03 SUBMITTALS

#### A. Certificates

1. Submit certification attesting that the composition analysis of pipe bedding and select material stone backfill materials meet specification requirements.
2. Submit certified compaction testing results from the soils testing laboratory.

#### B. Compaction Equipment List

1. Submit a list of all equipment to be utilized for compacting, including manufacturers' lift thickness limitations.

### 1.04 JOB CONDITIONS

#### A. Classification of Excavation

1. All excavation work is UNCLASSIFIED except excavation work shall be CLASSIFIED only if and when rock, as defined in "Section 02225 - Rock Removal" is encountered and necessitates removal. Excavation work

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includes excavation and removal of all soil, shale, rock, boulders, fill, and all other materials encountered of whatever nature.

2. All unit price bids for the sanitary sewer system installation shall consider excavation to be earth excavation. Payment for rock excavation is on a unit price basis.

#### B. Compaction of Backfill

1. The degree of compaction required at each location is as follows:

- a. In all roadways, proposed roadways, and shoulders the backfill shall be thoroughly compacted over and around the pipe by use of vibratory tamping pads or where these cannot be used, by mechanical or hand tamping. Backfilling shall be compacted to at least ninety-five percent (95%) of maximum dry density at optimum moisture content. Testing of trenches in State Highways shall be in accordance with PennDOT specifications.
- b. At stream crossings, the casing pipe shall be encased in concrete in accordance with the Contract Drawings. Areas above the pipe shall be backfilled with suitable backfill compacted to at least ninety-five percent (95%) of maximum dry density at optimum moisture content.
- c. All other areas shall be backfilled from top of bedding materials to a minimum of 1'-0" above the top of the pipe with the required backfill material and compacted to at least ninety-five (95%) of maximum density at optimum moisture content. Backfilling shall continue from a minimum of 1'-0" above the top of the pipe to the required grade with the specified material and compacted to at least eighty-five (85%) percent of maximum dry density at optimum moisture content.
- d. The optimum moisture content and the maximum dry density of each type of material used for trench backfill shall be determined by "Tests for Moisture-Density Relations of Soils, using 10 lb. Hammer and 18 inch Drop" (ASTM D1557 or ASSHO T-180).
- e. The field moisture content of materials being compacted shall be determined by "Laboratory Determination of Moisture Content of Soil" (ASTM D2216). The field density of compacted material shall be determined by "Standard Test Method for In-Place Density

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and Water Content of Soil and Soil Aggregate by Nuclear Methods" (ASTM D6938).

- f. Lift Thickness Limitations - Submit a list of the Compaction Equipment to be utilized on the Project, the recommendations of the equipment manufacturer as to the maximum lift thickness which can be placed, and the method of compaction to be used with this equipment to achieve the required compaction. In no case shall maximum lift thickness placed exceed the maximum limits specified by the manufacturer's recommendations. However, if the equipment manufacturer's lift thickness recommendation is followed and the specified compaction is not obtained, the Contractor shall, at his own expense, remove, replace and retest, as many times as is required, to obtain the specified compaction.

#### C. Control of Traffic

1. Employ traffic control measures in accordance with Pennsylvania DOT Publication 213, "Work Zone Traffic Control", and as indicated in Section 01570 entitled "Traffic Regulation".

#### D. Protection of Existing Utilities and Structures

1. Take all precautions and utilize all facilities required to protect existing utilities and structures. In compliance with Act 287 of the General Assembly of Pennsylvania, advise each Utility at least 3 working days in advance of intent to excavate, do demolition work or use of explosives and give the location of the job site. Request cooperative steps of the Utility and suggestions for procedures to avoid damage to its lines.
2. Advise each person in physical control of powered equipment or explosives used in excavation or demolition work of the type and location of utility lines at the job site. Request cooperative steps of the Utility and procedures to follow to prevent damage to existing utilities.
3. Immediately report to the Utility and the Engineer any break, leak or other damage to the lines or protective coatings made or discovered during the work and immediately alert the occupants of premises of any emergency created or discovered.
4. Allow access to Utility personnel at all times for purposes of maintenance, repair and inspection.

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5. Excavating machinery and cranes shall be operated with care to prevent damage to existing structures, paving and/or wires.
6. On paved surfaces, the Contractor shall not use or operate tractors, bulldozers or other power-operated equipment of which the treads or wheels will cut or otherwise damage such surfaces.
7. The Contractor must exercise care not to damage paving, curb, inlets, sidewalk, pavement etc. Any damages to areas outside the limit of trench width shall be replaced in kind by the Contractor at his own expense, to the satisfaction of the Engineer.
8. The restoration of existing property or structures shall be done as promptly and as practicable as possible and shall not be left until the end of the construction period. In no case shall restoration of areas not be completed within 30 days following the installation of the pipe except if weather does not permit final restoration.

## PART 2 PRODUCTS

### 2.01 PIPE BEDDING MATERIALS

- A. 2A Coarse Aggregate a minimum of 6" beneath pipe and up to springline of pipe, Table C, Section 703.2, Publication 408 Specifications, Latest Edition. Do not use slag, fly ash, silica fume, cinders and/or any other pozzolan with expansive/shrinkage properties.
- B. 2A Coarse Aggregate from springline to a minimum 1'-0" above pipe.

### 2.02 BACKFILL MATERIAL

- A. Select Material Backfill (Select Backfill)
  1. Coarse aggregate conforming to (2A Coarse Aggregate, Publication 408 Specifications, Latest Edition).
- B. Suitable Backfill Material (Other than State Highway Cartways and Shoulders)
  1. From springline of pipe to 12" minimum above the top of pipe.
    - a. Use 2A coarse aggregate for pipe materials.

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- b. In areas designated by the Engineer, natural material excavated from the trench free of roots or stones larger than 2" in size and free of wet, frozen, deleterious or organic materials may be used.
2. From 12" above pipe to road subgrade elevation.
  - a. Material excavated from the trench if free of roots or stones larger than 4" in size and free of wet, frozen, deleterious or organic materials.
- C. Suitable Backfill Material (State Highway Cartways and Shoulders)
  1. From springline of pipe to 12" minimum above the top of pipe.
    - a. For all pipe materials use 2A coarse aggregate.
  2. From 12" above pipe to road subgrade elevation
    - a. Material shall be flowable fill per Penn DOT 408, Latest Edition.
- D. Suitable Foreign Backfill Material
  1. Material meeting the requirements of paragraph B above which has to be rehailed or hauled further to the point of use than it would be to haul it to the spoil area.

## 2.03 SHEETING AND BRACING

### A. Wood Sheeting and Bracing

1. Shall be sound and straight; free from cracks, shakes and large or loose knots; and shall have dressed edges where directed.
2. Shall conform to National Design Specifications for Stress Grade Lumber having a minimum fiber stress of 1200 pounds per square inch.

### B. Steel Sheeting and Bracing

1. Shall be sound and straight; free from cracks and warping.
2. Shall conform to ASTM A 328 with a minimum thickness of 3/8 inch.

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#### PART 3 EXECUTION

##### 3.01 MAINTENANCE AND PROTECTION OF TRAFFIC

- A. Coordinate the work to insure the least inconvenience to traffic and maintain traffic in one or more unobstructed lanes unless closing the roadway is authorized.
- B. Maintain access to all streets and private drives.
- C. Provide and maintain signs, flashing warning lights, barricades, markers, and other protective devices as required to conform with construction operations and to keep traffic flowing with minimum restrictions, on a 24 hour basis.
- D. Comply with state and local codes, permits and regulations.

##### 3.02 CUTTING PAVED SURFACES

- A. Where installation of pipelines, miscellaneous structures, and appurtenances necessitate breaking a paved surface, make cuts in a neat uniform fashion forming straight lines parallel with the centerline of the trench in accordance with the Contract Drawings. Cut offsets at right angles to the centerline of the trench.
- B. Protect edges of cut pavement during excavation to prevent raveling or breaking; square edges prior to pavement replacement.
- C. The requirements for neat line cuts may be waived if the final paving restoration indicates overlay beyond the trench width.

##### 3.03 BLASTING (If Authorized)

- A. Verify site conditions and note irregularities affecting work of this Section. Beginning work of this Section means acceptance of existing condition.
- B. If rock is uncovered requiring the explosives method for rock disintegration, notify the Engineer and execute as follows:
  - 1. Conduct Seismic Survey
  - 2. Advise owners of adjacent buildings or structures in writing prior to setting up seismographs. Describe blasting and seismic operations.
  - 3. Disintegrate rock and remove from excavation.

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4. Conduct blasting operations to avoid injury to persons and property.
  5. Use explosive quantity and strength required to break rock approximately to intended lines and grades and yet leave rock in unshattered condition.
  6. Cover rock with logs or mats, or both where required.
  7. Issue sufficient audible warning to all persons prior to detonating a charge.
  8. Store caps and exploders separately from explosives.
  9. Remove all explosives from site at completion of blasting operations.
  10. Comply with additional and or more stringent requirements of governing authorities as applicable to work.
  11. Provide copies of insurance certificate indicating Contractor and any subcontractors all fully covered for blasting damage. Insurance policy shall be for a minimum of \$2,000,000.
- C. Blasting will be permitted except in areas as specified where the proximity of structures, underground facilities, or public safety preclude the use of explosives. Blasting will not be permitted in areas specifically listed on the Contract Drawings or Specifications. Nothing in this section shall relieve the Contractor of his responsibilities for damages.
- D. Blasting work shall be supervised by licensed and experienced personnel and performed in conformance with applicable Federal, State and local codes, including but not limited to:
1. PaDEP Rules and Regulations, Chapters 210 and 211
  2. OSHA General Industry Standard 29 CFR 1910.109 Explosive and Blasting Agents
  3. OSHA Construction Industry Standards & Interpretations, 29 CFR, 1926.900 Explosive and Blasting Agents
  4. PA Act 172
  5. PA Labor and Industry Code, Chapter 4, Subchapter D, Explosives; Subchapter E - Excavation and Construction



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- E. Before any blasting is carried out the Contractor shall complete the following:
1. Submit to the Engineer a report prepared by a professional engineer licensed to practice in the State of Pennsylvania or Geologist containing specified recommendations for blasting. Should the report indicate potential damage to existing facilities, the Owner will not allow blasting.
- F. All blasting in open cuts shall be properly covered and protected with approved blasting mats.
- G. Charges shall be of such size that the excavation will not be unduly large and shall be so arranged and time that adjacent rock, upon or against which pipelines or structures are to be built, will not be shattered.
- H. In accordance with Pa Title 67, Chapter 459, Paragraph 7(14);
1. No blasting will be performed within 25 feet of any bridge, box culvert or well.
  2. No blasting shall be conducted within any PennDOT road right-of-way, unless authorized by the Highway Occupancy Permit. If the Contractor desires to undertake blasting within the road right-of-way, he shall post the necessary bonds and assist the Owner in applying for and obtaining a revised Occupancy Permit prior to the initiation of blasting activities.
  3. If the Contractor desires to undertake blasting activities within 100 feet of any bridge, box culvert or well, a detailed plan, prepared by a professional engineer experienced in blasting, of excavating, shoring, blasting and backfilling shall be submitted to the Engineer. Work may not be initiated until approval has been received.
- I. Blasting will not be permitted within 25 feet of pipelines or 50 feet of structures.
- J. Pre-blast surveys shall be conducted of all structures within a 1000 foot radius of the blasting permit area or to satisfy the regulations of the PA Explosives and Blasting Laws.
- K. All blasting shall be field monitored using seismographic type equipment and shall be performed under the supervision of a professional engineer, licensed to practice in the State of Pennsylvania or a geologist.
- L. Submit to the Engineer an accurate record of each blast within 48 hours. The record shall show the general location of the blast, the depth and number of drill

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holes, the kind and quantity of explosive used, ground velocity and displacements, and other data required for a complete record.

#### M. Repair of Damages Due to Blasting

1. Any injury or damage to the work or to existing pipes or structures or wells shall be repaired or rebuilt by the Contractor at his own expense.
2. Whenever blasting may damage pipes, structures, or wells blasting shall be discontinued and the rock removed by drilling, barring, wedging or other methods.

#### N. Explosives

1. The maximum amount of explosives to be kept at the site shall not exceed the expected one day's usage. Such explosives shall be stored, handled and used in conformity with all applicable laws and regulations.
2. Accurate daily records shall be kept showing the amounts of explosives on hand, both at a site and at any storage magazine, the quantities received and issued, and the purpose for which issued.
3. The Contractor shall be responsible for any damage or injury to any persons, property or structures as a result of his handling, storage or use of explosives.

#### O. Rock Clearance in Trenches

1. Ledge rock, boulders and large stones shall be removed from the sides and bottom of the trench to provide clearance for the specified embedment of each pipe section, joint or appurtenance; but in no instance shall the clearance be less than 9-inches. Additional clearance at the pipe bell or joint shall be provided to allow for the proper make-up of the joint.

### 3.04 TRENCH EXCAVATION

#### A. Depth of Excavation

##### 1. Gravity Pipelines

- a. Excavate trenches to the depth and grade shown on the profile drawings for the invert of the pipe plus that excavation necessary for placement of pipe bedding material.

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#### 2. Pressure Pipelines

a. Excavate trenches to the minimum depth necessary to place required pipe bedding material and to provide 4 feet from the top of the pipe to the finished ground elevation, except where pipe is shown at a greater depth on the drawings.

3. Where unsuitable bearing material is encountered in the trench bottom, continue excavation until the unsuitable material is removed, solid bearing is obtained or can be established, or concrete cradle can be placed. If no concrete cradle is to be installed, refill the trench to required pipeline grade with pipe bedding material, in accordance with the Contract Documents.

4. Where the Contractor, by error or intent, excavates beyond the minimum required depth, the trench shall be backfilled with 2A coarse aggregate in lifts not exceeding 6" in loose/uncompacted thickness to the required pipeline grade at no extra cost to the Owner. Each lift shall be compacted to at least ninety-five percent (95%) of the maximum dry density at optimum moisture content.

#### B. Width of Excavation

1. Excavate trenches, including laterals, to a width necessary for placement and joining of the pipe, and for placing and compacting pipe bedding and trench backfill around the pipe, but not less than 12" plus the pipe outside diameter and no more than 24" plus the pipe outside diameter.

2. Shape trench walls completely vertical from trench bottom to at least 2' above the top of the pipe.

#### C. Length of Open Trench

1. Do not advance trenching operations more than 100' ahead of completed pipeline. At no time shall the trench be left open at the end of a work day.

### 3.05 SUPPORT OF EXCAVATION

A. Support excavations with sheeting, shoring, and bracing or a "trench box" as required to comply with Federal and State laws and codes.

B. Where sheeting, shoring, bracing or trench boxes are used, they must be designed and sealed by a professional engineer licensed to practice in Pennsylvania.

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- C. Install adequate excavation supports to prevent ground movement or settlement to adjacent structures, pipelines or utilities. Damage due to settlement because of failure to provide support or through negligence or fault of the Contractor in any other manner, shall be repaired at the Contractor's expense.
- D. Withdraw shoring, bracing, and sheeting as backfilling proceeds unless otherwise directed by the Engineer.

#### 3.06 CONTROL OF EXCAVATED MATERIAL

- A. Keep the ground surface, within a minimum of 2' of both sides of the excavation free of excavated material.
- B. Provide temporary barricades to prevent excavated material from encroaching on private property, walks, gutters, and storm drains.
- C. Maintain accessibility to all fire hydrants, valve pit covers, valve boxes, curb boxes, fire and police call boxes, and other utility controls at all times. Keep gutters clear or provide other satisfactory facilities for street drainage. Do not obstruct natural water courses. Where necessary, provide temporary channels to allow the flow of water either along or across the site of the work.
- D. In areas where pipelines parallel or cross streams, ensure that no material slides, is washed, or dumped into the stream course. Remove stream diversion berms immediately upon completion of pipeline construction within the stream area.

#### 3.07 DEWATERING

##### A. General

1. Comply with Federal and State requirements for dewatering to any watercourse. The Contractor shall at all times provide and maintain proper and satisfactory means and devices for the removal of all water entering the excavations, and shall remove all such water as fast as it may collect, in such a manner as shall not interfere with the prosecution of the work or the proper placing of pipes, structures, or other work.
2. Water pumped or drained from any excavation may not enter existing watercourse without passing through a "Desilting Basin" constructed of acceptable soil erosion and sedimentation control devices.

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3. Unless otherwise specified, all excavations which extend down to or below the static groundwater elevation shall be dewatered by lowering and maintaining the groundwater beneath such excavations at all times when work thereon is in progress, during subgrade preparation and the placing of structure or pipe thereon.
4. Water shall not be allowed to rise over or come in contact with any masonry, concrete or mortar, until at least 24 hours after placement, and no stream of water shall be allowed to flow over such work until such time as the Owner may permit or 7 days whichever is less.
5. Where the presence of fine grained subsurface materials and a high groundwater table may cause the upward flow of water into the excavation with a resulting quick or unstable condition, the Contractor shall install and operate a wellpoint system to prevent the upward flow of water during construction.
6. Water pumped or drained from excavations, or any sewers, drains or water courses encountered in the work, shall be disposed of in a suitable manner without injury to adjacent property, the work under construction, or to pavements, roads, drives, and water courses. No water shall be discharged to sanitary sewers. Sanitary sewage shall be pumped to sanitary sewers or shall be disposed of by an approved method.
7. Any damage caused by or resulting from dewatering operations shall be the sole responsibility of the Contractor.

#### B. Work included

1. Installation
  - a. The wellpoint system shall be designed and installed by or under the supervision of an organization whose principal business is wellpointing and which has at least five consecutive years of similar experience and can furnish a representative list of satisfactory similar operations.
  - b. Wellpoint headers, points and other pertinent equipment shall not be placed within the limits of the excavation in such a manner or location as to interfere with the laying of pipe or trenching operations or with the excavation for and construction of other structures.

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- c. Detached observation wells of similar construction to the wellpoints shall be installed at intervals of not less than 50 feet along the opposite side of the excavation from the header pipe and line of wellpoints, to a depth of at least five feet below the proposed excavation. In addition, one wellpoint in every 50 feet shall be fitted with a tee, plug and valve so that the wellpoint can be converted for use as an observation well. Observation well shall be not less than 1-1/2" in diameter.
- d. Standby gasoline or diesel powered equipment shall be provided so that in the event of failure of the operating equipment, the standby equipment can be readily connected to the system. The standby equipment shall be maintained in good order and actuated regularly not less than twice a week.

#### 2. Operation

- a. Where wellpoints are used, the groundwater shall be lowered and maintained continuously (day and night) at the level not less than two feet below the bottom of the excavation. Excavation will not be permitted at a level lower than two feet above the water level as indicated by the observation wells.
- b. The effluent pumped from the wellpoints shall be examined periodically by qualified personnel to determine if the system is operating satisfactorily without the removal of fines.
- c. The water level shall not be permitted to rise until construction in the immediate area is completed and the excavation backfilled.

### 3.08 PIPE BEDDING REQUIREMENTS

#### A. Type II Bedding

1. Pipe bedding to be 2A Coarse Aggregate extending from a minimum depth of 6" below the outside diameter of the pipe to the springline of the pipe.
2. Approved suitable material to be used from the spring line of the pipe to one foot above the pipe.
3. Use with Cast Iron, Ductile Iron and Reinforced Concrete Gravity Pipe.

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#### B. Type IV Bedding

1. Pipe bedding to be 2A coarse aggregate extending from a minimum depth of six (6") inches below the outside diameter of the pipe to the springline of the pipe.
2. Additional bedding to extend from the springline of the pipe to a minimum of 1'-0" above the top of the pipe shall be 2A coarse aggregate.
3. Bedding to be placed in maximum 6" lifts compacted to at least ninety-five percent (95%) of maximum dry density at optimum moisture content.
4. Use with PVC pipe.

#### C. Type V Bedding

1. Concrete cradle and concrete encasement shall be poured on undisturbed suitable earth.

### 3.09 PIPE LAYING

- A. Care shall be taken to lay the pipe to true lines and grades. Every pipe laid shall be tested as to grade and alignment. Care must be taken to fit the joints together properly so that the centers of the pipes shall be in one and the same straight line, and so as to give an opening of even thickness, all around between spigot end of pipe and the socket end of specials and fittings. Each section of pipe shall rest upon the pipe bed for the full length of its barrel, with recesses excavated to accommodate bells and joints. Any pipe that has its grade or joints disturbed after laying, shall be taken up and relaid. The interior of all pipe shall be thoroughly cleaned of all foreign matter, before being lowered into the trench, and shall be kept clean during laying operations by means of plugs or other approved methods. Under no circumstances shall pipe be laid in water, and no pipe shall be laid when trench conditions, or the weather, is unsuitable for such work. In all cases, water shall be kept out of the trench until the concrete, where used, has hardened. Every precaution necessary to obtain watertight construction for all joints must be taken. This same precaution must be taken for all connections with manholes.

### 3.10 THRUST RESTRAINT

- A. Provide pressure pipe with concrete thrust blocking or use restrained joint fittings at all bends, tees, valves, and changes in direction, in accordance with the Contract Drawings.

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#### 3.11 BACKFILLING TRENCHES

- A. After pipe installation and inspection, hand place remaining pipe bedding material in accordance with the type bedding specified, and carefully hand compact around pipe to provide specified compaction around and under the pipe.
- B. For standard trenches not in paved areas, for PVC pipe backfill to a minimum of 12 inches above the top of the pipe with 2A coarse aggregate and carefully compact to at least ninety-five percent (95%) of maximum dry density at optimum moisture content. For ductile iron pipe and above the 2A stone where PVC pipe is utilized, backfill the remainder of the trench with suitable material in maximum 12" lifts and compact to at least eighty-five percent (85%) of maximum dry density at optimum moisture content.
- C. For trenches in paved highways and shoulders owned and maintained by PADOT backfill the entire trench from the top of the bedding material to the finished subgrade elevation as shown on the Contract Drawings with Flowable Fill. Under no circumstances shall the depth of a lift exceed twelve (12) inches. Upon completion of the Flowable Fill operation replace road surface in accordance with section entitled "Paving and Resurfacing."
- D. For other trenches in paved roadways and in shoulders for PVC pipe backfill to a minimum of 12" above the top of the pipe with 2A coarse aggregate and carefully compact to at least ninety-five percent (95%) of maximum dry density at optimum moisture content. For ductile iron pipe and above the 2A stone where PVC pipe is utilized, backfill the remainder of the trench with suitable backfill material in maximum twelve (12") inch lifts and compact to at least ninety-five percent (95%) of maximum dry density at optimum moisture content.
- E. For trenches in streambeds backfill from the top of the concrete encasement to existing streambed with suitable backfill and compact to at least ninety-five percent (95%) of maximum dry density at optimum moisture content.
- F. Unsuitable Backfill Material
  1. Where the Engineer deems backfill material to be unsuitable and rejects all or part thereof due to conditions prevailing at the time of construction, remove the unsuitable material and replace with select material stone backfill or suitable foreign backfill material.



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3.12 DISPOSAL OF EXCAVATED MATERIAL

- A. Excavated material remaining after completion of backfilling shall remain the property of the Contractor, removed from the construction area, and legally disposed of.

3.13 ROUGH GRADING

- A. Rough grade areas disturbed by construction to a uniform finish within 48 hours. Form the bases for terraces, banks, lawns, and paved areas.
- B. Grade areas to be paved to depths required for placing subbase and paving materials within 48 hours.
- C. Rough grade areas to be topsoiled and seeded to the required depth below finish contours within 48 hours.

3.15 RESTORATION OF SURFACES

- A. Restore surfaces disturbed by construction to at least equal the surface condition prior to construction in the opinion of the Engineer.
- B. Restore grassed areas in accordance with Engineer requirements as specified in the specification entitled "Grading and Seeding - Section 02485".

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